

FORM PTO-1390
(Rev. 11-2000)

U.S. DEPARTMENT OF COMMERCE ATENT AND TRADEMARK OFFICE

**TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371**ATTORNEY'S DOCKET NUMBER
53550.42

U.S. APPLICATION NO

10/049991

INTERNATIONAL APPLICATION NO.

PCT/NO00/00263

INTERNATIONAL FILING DATE

14 August 2000

PRIORITY DATE CLAIMED

20 August 1999

TITLE OF INVENTION : Methods and System for Processing of Drilling Fluids

APPLICANT(S) FOR DO/EO/US

Per Espen Edvardsen

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. ☒ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☐ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☐ is attached herewith (required only if not communicated by the International Bureau).
 - b. ☒ has been communicated by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US)
6. ☒ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☐ is attached hereto.
 - b. ☒ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
 - b. ☒ have been communicated by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☐ have not been made and will not be made.

An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). (unexecuted)
10. ☐ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 20 below concern other document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☐ A **FIRST** preliminary amendment.
14. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
15. ☐ A substitute specification.
16. ☐ A change of power of attorney and/or address letter.
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821-1.825.
18. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 15(d)(4).
20. ☐ Other items or information:

**27162**

PATENT TRADEMARK OFFICE

U.S. APPLICATION NO. (If known, see 37 C.F.R. 1.51)

10/049991

INTERNATIONAL APPLICATION NO.
PCT/NO00/00236ATTORNEY'S DOCKET NUMBER
53550.4121. ☒ The following fees are submitted:**Basic National Fee (37 CFR 1.492(a)(1)-(5)):**

Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO and JPO

\$1040.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO

\$890.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO

\$740.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4)

\$710.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4)

\$100.00

CALCULATIONS PTO USE ONLY**ENTER APPROPRIATE BASIC FEE AMOUNT =**

\$ 1040.00

Surcharge of \$130.00 for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(e)).

\$

CLAIMS

NUMBER FILED

NUMBER EXTRA

RATE

\$

Total Claims

7 - 20 =

0

X \$18.00

\$

Independent Claims

2 - 3 =

X \$84.00

\$

MULTIPLE DEPENDENT CLAIM(S) (if applicable)

+ \$280.00

\$

TOTAL OF ABOVE CALCULATIONS

=

\$ 1,040.00

Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2

\$

520.00

SUBTOTAL

=

\$ 520.00

Processing fee of \$130.00 for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(f))

\$

TOTAL NATIONAL FEE

=

\$ 520.00

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property

\$

TOTAL FEES ENCLOSED =

\$

520.00

Amount to be
refunded:
charged:

\$

\$

- a. ☒ A check no. 6720 in the amount of \$520.00 to cover the above fees is enclosed.
- b. ☐ Please charge my Deposit Account No. 03-0678 in the amount of \$_____ to cover the above fees. A duplicate copy of this sheet is enclosed.
- c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 03-0678. A duplicate copy of this sheet is enclosed.
- d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit Card information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Francis C. Hand, Esq.
Carella, Byrne, Bain, Gilfillan, Cecchi, Stewart & Olstein
6 Becker Farm
Roseland, New Jersey 07068

SIGNATURE

Francis C. Hand

NAME

REGISTRATION NUMBER 22,280

EXPRESS MAIL LABEL

EL146098176US

DATE: February 19, 2002, 2002

2/pvt

10/049991
JC13 Rec'd PCT/PTO 19 FEB 2002Method and system for processing of drilling fluid

The present invention relates to a method and a system for processing of drilling fluid from a drilling hole in an underwater well to a floating drilling rig or drilling vessel. In particular, the invention relates to processing of drilling fluid before a blow-out valve is connected to the drilling hole and a riser is connected between the drilling hole and the floating drilling rig or drilling vessel.

Today's demands relating to environmental discharges puts great demands on the operators in the oil industry. For example, some of the operators stipulate that there shall not be any discharge of drilling fluid during drilling. During drilling of a new oil well in the ocean bed, or drilling in an already existing well, large amounts of drilling fluid, which must be treated, are produced. This can be oil-based drilling fluid or water-based drilling fluid, depending on whether the drilling which is being carried out, is top-hole drilling or drilling in the oil zones.

In this application, drilling fluid is meant to be fluids which appear during drilling in a drilling hole, such as cuttings, drilling mud, or other drilling fluids.

In recent years, the environmental threats which the oil industry poses have been given increasingly more focus. The authorities have imposed increasingly stronger demands on care for the environment and have strict rules for discharges from offshore installations, as these can have negative effects on the maritime environment. Today, there are, in the main, strict restrictions with regard to discharges of oil-based drilling mud, and discharges of this type have almost been completely stopped in the Norwegian sector of the North Sea.

In a standard well, in which the following holes are drilled without risers (36" - 225m. 26" - 1200m), more than 340 m³ of cuttings will be produced directly from the well. In addition, there is the drilling mud with its mixture of

different chemicals. The Norwegian Pollution Control Authority (SFT) introduced a complete ban on dumping of drilling mud and/or drilling fluid in the Norwegian sector of the North Sea in 1993. This was the start of what is today called slurry-fixing plants, which are able to process the return of fluid to the drilling hole.

Today, most of the fixed installations have such plants, but they are only used for injection of oil-containing waste. The injection is carried out in an annular space between two casings in the drilling hole, normally casings with diameters of around 340 mm and 508 mm (13 3/8" and 20"). This is based on a pump rate of about 4000 l/min under drilling of about a 311 mm (12 1/2") section and about a 216 mm (8 1/2") section.

Water-based drilling fluids are discharged directly to the sea and sink to the ocean bottom, something that creates environmental problems for the maritime life both in the ocean and at the ocean bottom. Discharges of drilling fluids can be carried out with the aid of a pump which is connected on a base at the drilling hole. The pump acts as a suction pump to create a negative pressure in a sealing device which is arranged round the drill column in the drilling hole.

Disadvantages with today's methods are that if the water-based drilling fluid is to be transported up to the drilling rig to be injected into a corresponding well, many problems to which there are no solutions at present arise. For example, during top-hole drilling, there are no maritime risers, i.e. a vertical riser which transports drilling mud from the ocean bottom and up to the drilling platform, and in addition, there is no annular space for injection of the water-based drilling fluid.

US 4,149,603 disclose a system and a method of underwater drilling operation, which returns drilling mud to the surface of the water, without the use of a riser, but after a BOP is installed. The system comprises a mud sump connected to the top of a submerged wellhead and pump means to pump mud through a hose and to the surface.

EP 0290250 discloses a method and apparatus for drilling sub sea wells at large depths, where drilling return mud is pumped to the surface by a centrifugal pump. The apparatus is attached to top of the blow-out preventer stack.

None of the prior art documents discloses methods or apparatuses adapted to be used before a riser is connected and a blow-out preventer is installed on the wellhead.

There is, therefore, a need for a method that can remove discharges of drilling fluid returns at a drilling rig or drilling vessel, and which can be applied in connection with the already existing drilling hole applications both on the ocean bottom and on the drilling rig, before both riser and blow-out preventer is installed. There is also a need for a system to carry out the method according to the present invention.

Advantages with the method according to the present invention are that great savings are achieved by being able to recirculate drilling fluid returns. Full drilling rate is maintained in the different sections, i.e. about 311 mm and about 216 mm (12 3/4" and 8 1/2") sections. Moreover, the environment is spared from unnecessary discharges. A faster slurrification of the drilling fluid which is produced during drilling is also achieved, i.e. faster treatment of the pumpable fluid or mud which consists of a solid material sedimented in a fluid. Less strict demands for the slurry. No wearing of casings will occur, and there is no danger that the casing will be damaged. Drilling fluid is kept away from the template, i.e. the base, and no concrete is used around the template. This gives a clear view for the ROV operator (Remotely Operated Vehicle). A greater injection rate is also achieved. In addition, the drilling fluid can also be stored for later, to be transported away from the floating drilling rig.

In connection with drilling on the ocean bed, drilling fluid is formed around the drilling mould (template). It is normal to use remote controlled underwater vehicles (ROV - "remote operated vehicle") with a camera, to monitor and

carry out various operations, and the drilling fluid/mud in the area around the drilling hole orifice represents, therefore, a considerable visual problem. Cuttings are fragments of rocks, which under drilling are brought up
5 with the drilling mud.

The object of the present invention is, therefore, to provide a method and a system, which eliminates the abovementioned problems. It is also an object to provide a method and a system of processing drilling fluid return
10 from a drilling hole in an underwater well at a floating drilling rig or a drilling vessel, comprising a sealing device connected to a well head, and a pump module to transport drilling fluid, a treatment plant, or a storage installation, for drilling fluid and possibly an injection
15 pump.

The method, according to the present invention, is characterised in that before a blow-out valve is connected to the well head, the submerged pump module and the sealing device provides an outlet pressure, dependent on the
20 specific weight of the mud and the ocean depth, which is high enough for transportation of the drilling fluid from the drilling hole, through the return line and up to the floating drilling rig or drilling vessel.

The system, according to the present invention, is characterised in that a pump module, which is arranged on the ocean bed and connected to a sealing device, is adapted to transport drilling fluid from the drilling hole on the ocean bed, via a return line, to a treatment plant, or a storage installation, on the floating drilling rig or
25 drilling vessel.
30

Preferred embodiments of the method, according to the present invention, are specified in that the pump module placed on the ocean bed and the sealing device provides an outlet pressure, dependent on the weight of the mud and
35 ocean depth, which is high enough to transport drilling fluid from the drilling hole, through the return line and up to the floating drilling rig or drilling vessel. The drilling fluid is transported through the return line and

to the existing line (flow-line) on the floating drilling rig or drilling vessel for further transport to the treatment plant or storage installation. After the cuttings is treated, using a method that may be known previously, on the floating drilling rig or drilling vessel, the treated cuttings is injected, with the aid of a high-pressure pump, into a second drilling hole provided on the ocean bed, or in an adapted annular space in the first drilling hole.

Preferred embodiments of the system are characterised in that the submerged pump module and the sealing device, before a blow-out valve is connected to the well head, are adapted to provide an outlet pressure which is high enough for transportation of the drilling fluid from the drilling hole, through the return line and up to the floating drilling rig or drilling vessel.

The pump module placed on the ocean bed comprises a number of pumps to provide the necessary pressure, such as a centrifuge and/or a friction pump possibly connected in series, where the pump, or pumps, is driven by a submerged electric motor which is connected to the pump or pumps.

A preferred embodiment, according to the present invention, shall now be described with reference to the enclosed figures. It must be understood that this example is not limiting and that other and further modifications may be carried out within the scope of the claims.

Figure 1 shows a principle of the method and the system for processing of a drilling fluid according to the present invention.

Figure 2 shows a section of an injection well according to figure 1.

To a first drilling hole 10 which is already drilled in the ocean bed, it is common to connect a sealing device 12, which normally is described as a suction and centralisation module (SCM), as shown in figure 1. This sealing device 12 is connected to the well head of the first drilling hole 10, for example, to form a seal between the foundation at the well head and a pipe string up to the

drilling rig, and to create a negative pressure in the drilling hole for suction of drilling fluid.

The present invention applies, amongst other things, such a known system, with a sealing device for removal of drilling fluid from a drilling hole orifice, which is characterised in that between the inner surface of the casing and outer surface of the drilling column an end-piece which forms a seal, basically a watertight seal, is arranged between the casing and the drilling column, and that at least one exit passage is arranged in the casing which is connected directly to a line system whereupon a pump module, for example, can be connected. This system is based on the applicant's Norwegian patent application no. 19982394.

A pump module 14 is connected to this exit passage or outlet on the sealing device 12 for suction of drilling fluid/drilling mud. The outlet pressure is dependent on weight of mud and water depth. For example, at a water depth of 400 m and a mud weight of 1.7, the pressure will be approximately 22 bars. Because of the negative pressure in the well head 10 generated by the sealing device 12 and the pump module 14, a lifting height, including pressure drop and lifting reduction because of the weight of the slurry, is generated, sufficient to lift the drilling fluid up to an existing line on the drilling rig, for example an already existing "flow line", which is well known to those skilled in the art. Transport of the drilling fluid from the pump module 14 to the existing line can, for example, be carried out in a about 152 mm (6") or 203 mm (8") pipe/line 16 which is connected to the already existing line (flow line) on the drilling rig. The pipe 16 must be of a type which can withstand the working-pressure which is necessary to lift the slurry up to the floating drilling rig or drilling vessel.

The pump module comprises a pump of known type which can pump seawater, drilling fluid and cuttings under high pressure. At greater depths, it may be necessary with a multi-step solution, for example, two or more pumps

connected in series, to obtain the required pressure. The pump is arranged as a module which can be tested and thereafter lowered down to the ocean bed ready for use after pipes have been connected to the inlet and outlet. To
5 reduce the weight and dimensions, it seems sensible to use a centrifugal and/or friction pump driven by a submerged electric motor, which is connected directly to the pump. The power supply can be arranged in a compounded umbilical cord (umbilical), which can also be used to lower the pump
10 down to the ocean bed.

After transport of the drilling fluid to the floating drilling platform or drilling vessel, the drilling fluid is thereafter led to a treatment plant, or alternatively, a storage installation on the floating drilling rig or
15 drilling vessel for further transport to another treatment plant or storage installation.

The treatment plant on the floating drilling rig or drilling vessel comprises, for example, a shaking unit (shaker), a first storage tank, a mixing tank, a crushing
20 unit, other storage tanks, and a high-pressure injection pump, etc.

The water-based drilling mud is strained in the shaking unit. Extra seawater is strained and returned to a storage tank, for mixing of slurry for injection. When this
25 method is used, approximately 80 to 90 % of the water-based drilling mud can be recirculated. This gives very large cost savings per day during, for example, top-hole drilling. After the drilling fluid has been strained in the shaking unit, it is transported to a tank which comprises a
30 number of crushing units or crushing pumps. The slurry is crushed in the crushing units or crushing pumps to a preferred particle size of around 10 to 20 μ , or another suitable size, whereupon the matter is pumped to a storage tank before it is transferred to an injection unit, such as
35 for example a high-pressure pump, for injection into a second drilling hole 18. This injection can, for example, be carried out in a 102 mm (4") injection tube 20 with a working pressure of between approximately 35-150 bars.

The method, according to the present invention, can also include that an injection well is drilled at a distance from the first drilling hole 10. An example of a new injection well is shown in figure 2, and can, for example, be a well 18 which is drilled for placing of a 178 mm (7") casing 22 in a 340 mm (13 3/8") casing 24, with, for example, a well depth of approximately 500 to 1500 m. This well depth can also vary, depending on the formation which is being drilled, and how receptive the formation is to the drilling fluid which is to be injected. An area 26 of the lower part of the inner casing is perforated for injection of the water-based drilling fluid.

Injection of the drilling fluid can also be performed in the first drilling hole (10), in a suitable annular space which may be between the casing and formation.

The drilling fluid, which is stored in the storage tank on the drilling rig, is injected with by the high-pressure pump, and through a wellhead system which is connected onto the well. This wellhead system can be of a type which, for example, gives a wear-free injection and which also increases the capacity of the injection.

In principle, the treatment plant can be placed at an arbitrary place as long as the drilling fluid can be pumped to the treatment plant and the drilling fluid can be injected into the second drilling hole. In the first example conducted, the treatment plant is placed on the drilling rig, because the already existing treatment plant is normally installed there, but the treatment plant for the drilling fluid can, off course, be placed somewhere else.

Thus, a new method and system for transport drilling fluid from a drilling hole on the ocean bed to a floating drilling rig or drilling vessel is provided, improving the environment in the sea.

Claims

1. Method for processing of drilling fluid from a drilling hole (10) in an underwater well to a treatment plant, or a storage installation, arranged on a floating drilling rig or drilling vessel, for treatment or storage of cuttings, where the drilling fluid, before a riser is connected between the drilling hole and the floating drilling rig or drilling vessel, is being transported from the drilling hole (10) on the ocean bed by a submerged pump module (14) connected to a sealing device (12), via a return line (16), to the treatment plant or storage installation on the floating drilling rig or drilling vessel, characterised in that before a blow-out valve is connected to the well head, the submerged pump module (14) and the sealing device (12) provides an outlet pressure, dependent on the specific weight of the mud and the ocean depth, which is high enough for transportation of the drilling fluid from the drilling hole (10), through the return line (16) and up to the floating drilling rig or drilling vessel.

2. Method in accordance with claim 1, characterised in that drilling fluid is being transported through the return line (16) to an existing line, such as a flow line, on the floating drilling rig or drilling vessel for further transportation to the treatment plant or storage installation.

3. Method in accordance with claim 2, characterised in that, after the cuttings has been treated, using a method which per se is known, on the floating drilling rig or drilling vessel, the treated cuttings is being injected in a second drilling hole (18) provided on the ocean bed, or in a suitable annular space in the first drilling hole (10).

4. System for processing of drilling fluid from a drilling hole (10) in an underwater well to a floating drilling rig or drilling vessel, particularly before a riser is connected between the drilling hole and the floating drilling rig or drilling vessel, a submerged pump module (14), connected to a sealing device (12), is arranged for transportation of drilling fluid from the drilling hole (10) on the ocean bed, via a return line (16), to a treatment plant or a storage installation on the floating drilling rig or drilling vessel, characterised in that the submerged pump module (14) and the sealing device (12), before a blow-out valve is connected to the well head, are adapted to provide an outlet pressure which is high enough for transportation of the drilling fluid from the drilling hole (10), through the return line (16) and up to the floating drilling rig or drilling vessel.

5. System in accordance with claim 4, characterised in that the submerged pump module (14) and the sealing device (12) together form a suction and centralisation module, arranged at the wellhead.

6. System in accordance with claim 5, characterised in that the pump module's (14) speed/output is adjustable in relation to the return flow from the well, wherein the requested differential pressure is maintained at the sealing device (12).

7. System in accordance with claim 5, characterised in that the submerged pump module (14) arranged on the ocean bed comprises a number of pumps to provide necessary pressure, such as a centrifugal and/or a friction pump connected in series, in which the pump, or pumps, are driven by a submerged electric motor which is connected to the pump, or pumps.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau(43) International Publication Date
1 March 2001 (01.03.2001)

PCT

(10) International Publication Number
WO 01/14688 A1(51) International Patent Classification⁷: E21B 21/10

(21) International Application Number: PCT/NO00/00263

(22) International Filing Date: 14 August 2000 (14.08.2000)

(25) Filing Language: Norwegian

(26) Publication Language: English

(30) Priority Data:
19994024 20 August 1999 (20.08.1999) NO(71) Applicant (for all designated States except US): AGR
SERVICE A/S [NO/NO]; N-5363 Ågotnes (NO).

(72) Inventor; and

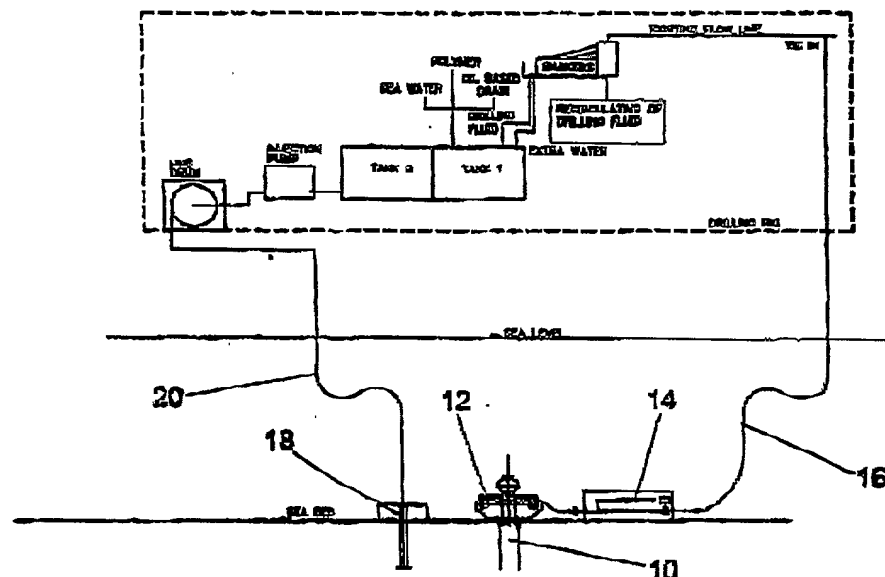
(75) Inventor/Applicant (for US only): EDVARDSEN, Per,
Espen [NO/NO]; Bjørndalstråter 132, N-5171 Løddesfjord
(NO).(74) Agent: AS BERGEN PATENTKONTOR; C. Sundstgt.
36, N-5004 Bergen (NO).(81) Designated States (national): AE, AG, AL, AM, AT, AU,
AZ, BA, BE, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ,
DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR,
HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,
LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ,
NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM,
TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.(84) Designated States (regional): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian
patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European
patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE,
IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG,
CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:

— With international search report.

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: METHOD AND SYSTEM FOR PROCESSING OF DRILLING FLUID



(57) Abstract: A method and a system are described for processing of drilling fluid from a drilling hole (10) in an underwater well to a floating drilling rig or drilling vessel, comprising a sealing device (12) connected to a well head, a pump module (14) to transport drilling fluid, a treatment plant for treatment of drilling fluid, or a storage installation. Before a blow-out valve is connected to the well head and before a riser is connected between the drilling hole and the floating drilling rig or drilling vessel, the pump module (14) placed on the ocean bed transports drilling fluid from the drilling hole (10) on the ocean bed to the floating drilling rig or drilling vessel.

20110401 16554001

WO 01/14688 A1

10/049991

2/2

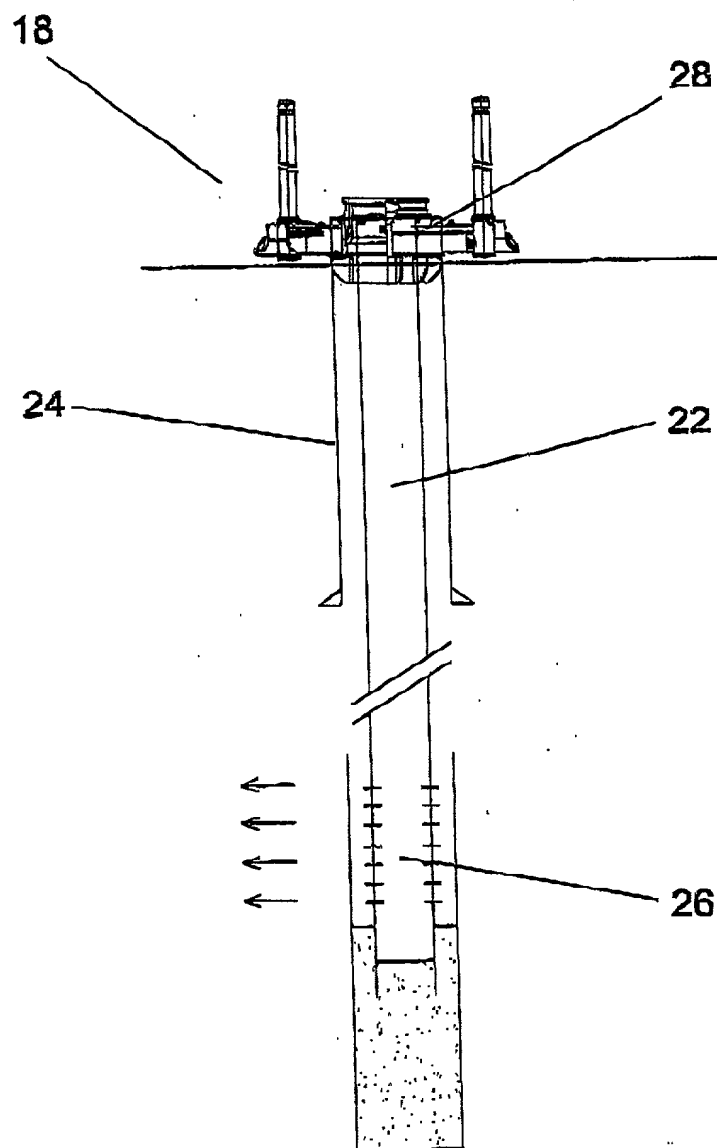


FIG. 2

201140-1664001



27162

PATENT TRADEMARK OFFICE

Please type a plus sign (+) inside this box



PTO/SB/01 (10/00)

Approved for use through 10/31/2002. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. Department of Commerce

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number

DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63) <input checked="" type="checkbox"/> Declaration Submitted with Initial Filing OR <input type="checkbox"/> Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (e)) required)	Attorney Docket Number	53550.42
	First Named Inventor	Per Espen Edvardsen
	COMPLETE IF KNOWN	
	Application Number	
	Filing Date	
	Group Art Unit	
	Examiner Name	

As a below named Inventor, I hereby declare that:

My residence, mailing address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled.

METHOD AND SYSTEM FOR PROCESSING OF DRILLING FLUIDS

(Title of the invention)

the specification of which

☐ is attached hereto
OR☒ was filed on 14 August 2000 as United States Application Number or PCT International Application Number PCT/NO00/00263 and was amended on (mm/dd/yyyy) (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
				YES	NO
PCT/NO00/00263 19994024	WIPO Norway	14 August 2000 12 July 1999	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below.

Application Number(s)	Filing Date (MM/DD/YYYY)	<input type="checkbox"/> Additional provisional application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

[Page 1 of 2]

Burden Hour Statement: This form is estimated to take 21 minutes to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, D.C. 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, Washington, D.C. 20231.

Please type a plus sign (+) inside this box



PTO/SB/01 (10/00)

Approved for use through 10/31/2002. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. Department of Commerce

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number

DECLARATION ---- Utility or Design Patent Application

Direct all correspondence to: ☒ Customer Number or Bar Code Label 27162 OR ☐ Correspondent address below

Name Francis C. Hand, Esq.
Carella, Byrne, Bain, Gilfillan, Cecchi, Stewart & Olstein

Address 6 Becker Farm Road

City Roseland

State NJ

ZIP 07068

Country USA

Telephone (973)994-1700

Fax (973)994-1744

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

NAME OF SOLE OR FIRST INVENTOR: ☐ A petition has been filed for this unsigned inventor.

Given Name
(first and middle [if any]) Per Espen

Family Name
or Surname Edvardsen

Inventor's
Signature

Date 11/3-02

Residence:

City Loddefjord

State NOX

Country Norway

Citizenship Norwegian

Mailing Address Bjorndalsbratet 132, N-5171 Loddefjord, Norway

Mailing Address

City

State

ZIP

Country

NAME OF SECOND INVENTOR: ☐ A petition has been filed for this unsigned inventor.

Given Name
(first and middle [if any])

Family Name
or Surname

Inventor's
Signature

Date

Residence:

City

State

Country Norway

Citizenship Norwegian

Mailing Address

Mailing Address

City

State

ZIP

Country

☐ Additional inventors are being named on the _____ supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto.

131138